

motion parameters for a pair of pictures from the block-by-block motion parameters originating from a coder 15. In a format converter 14, picture signals from a line memory 13 are motion compensated by the picture-by-picture motion parameters and are coupled to a frame memory 22 which also receives picture signals delayed by one field. The output of the frame memory contains frame signals with maximum vertical local resolution.

The subject invention concerns motion estimation in which in determining the parameter sets, only those parts of the image are taken into account in which the first video image is significantly distinguished from the second video image. To that end, as claimed in claim 1, the subject invention includes "selecting parts of an image frame in which a first video image is significantly distinguished from a second video image", and "determining, in the selected parts in the first and a second video images, parameter sets of two or more motion models".

It has been well established that "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Applicants submit that Herpel et al. neither shows nor suggests each and every element as set forth in the claim. In particular, in rejecting claims 1 and 4, the Examiner paraphrases

the wording in the claims and cites Fig. 2, elements 22 and 24, and col. 2, lines 51-55, as disclosing these limitations. However, element 22, as noted above, is a frame memory, while element 24 is an input to motion compensation circuit 23 which carries the picture-by-picture motion parameters from the motion parameter generator 16.

Further, the passage in Herpel et al. cited by the Examiner (i.e., col. 2, lines 51-55) states:

"A motion parameter generator 16 generates picture-by-picture motion parameters  $pn-1$  for a pair of pictures  $sn-2$ ,  $sn-1$  ( $z$ ,  $vx$ ,  $vy$ ) from the block-by-block motion parameters, for example, for zoom and pan, originating from coder 15."

Applicants submit that it should be clear that these components of Herpel et al., nor any other components of Herpel et al., perform the steps "selecting parts of an image frame in which a first video image is significantly distinguished from a second video image", and "determining, in the selected parts in the first and a second video images, parameter sets of two or more motion models", as claimed in claim 1, nor, as claimed in claim 4, "of the selected parts, those parts of the image area in which motion was determined in previous video image data of a sequence of video images, are taken into account for determining the parameter sets."

The De Haan et al. patent discloses motion estimation and motion-compensated interpolation, in which input fields of a video

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signal are applied to a plurality of parameter estimators for determining motion parameters, and in which to simplify the input to the parameter calculation means, the parameter vector is selected from a number of candidate parameter vectors as the one that has the minimal value of a match criterion.

The subject invention, as claimed in claim 2, defines the selecting step of claim 1 as "dividing a current and a previous video image into respective pluralities of blocks", and "evaluating deviations between the current and the previous video image block by block, taking those blocks as said selected parts in which the a value of the deviation exceeds a predetermined threshold value".

Applicants submit that while De Haan et al. teaches motion estimation, De Haan et al. neither shows nor suggests "evaluating deviations between the current and the previous video image block by block". Rather, De Haan et al. evaluates the candidate parameter vectors and selects the one that has the minimal value of a match criterion calculated in accordance with a given formula. Nowhere in De Haan et al. is it shown or suggested that deviations between a current and previous image blocks should be evaluated. Rather, De Haan et al. evaluates the parameter vectors being generated by the parameter estimators.

The present invention as claimed in claim 3, further limits claim 2, in that "the threshold value is based on the condition that the number of image areas taken into account for

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determining the parameter sets is limited to a predeterminable value".

It is apparent that the Examiner is misreading or does not understand the claim. In particular, claim 3 does not state that the threshold value is a predeterminable value. Rather, claim 3 indicates the condition that the number of image areas used for determining the parameter sets is limited to a predetermined number, and the threshold value is based on this condition.

Herpel et al. discloses generating picture-by-picture motion parameters from the block-by-block motion parameters (col. 2, lines 51-55). However, there is no disclosure in Herpel et al. or in De Haan et al. of limiting the number of image areas to a predetermined number, and that the threshold value, concerning the deviation of the current and previous image, should be based on this condition.


The Lee et al. patent discloses object-based video compression process employing arbitrarily-shaped features, in which a computer 20 has resident software for arguably performing motion estimation. However, Applicants submit that Lee et al. does not supply that which is missing from Herpel et al., i.e., block-wise comparing the video data of the first and second video images and selecting those blocks exhibiting significant differences between the first and second video images, and computing parameter sets of two or more motion models and supplying motion data describing the

displacement of image objects from the previous to the current image based on the selected blocks.

In view of the above, Applicants believe that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicants believe that this application, containing claims 1-5 and 7, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by   
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